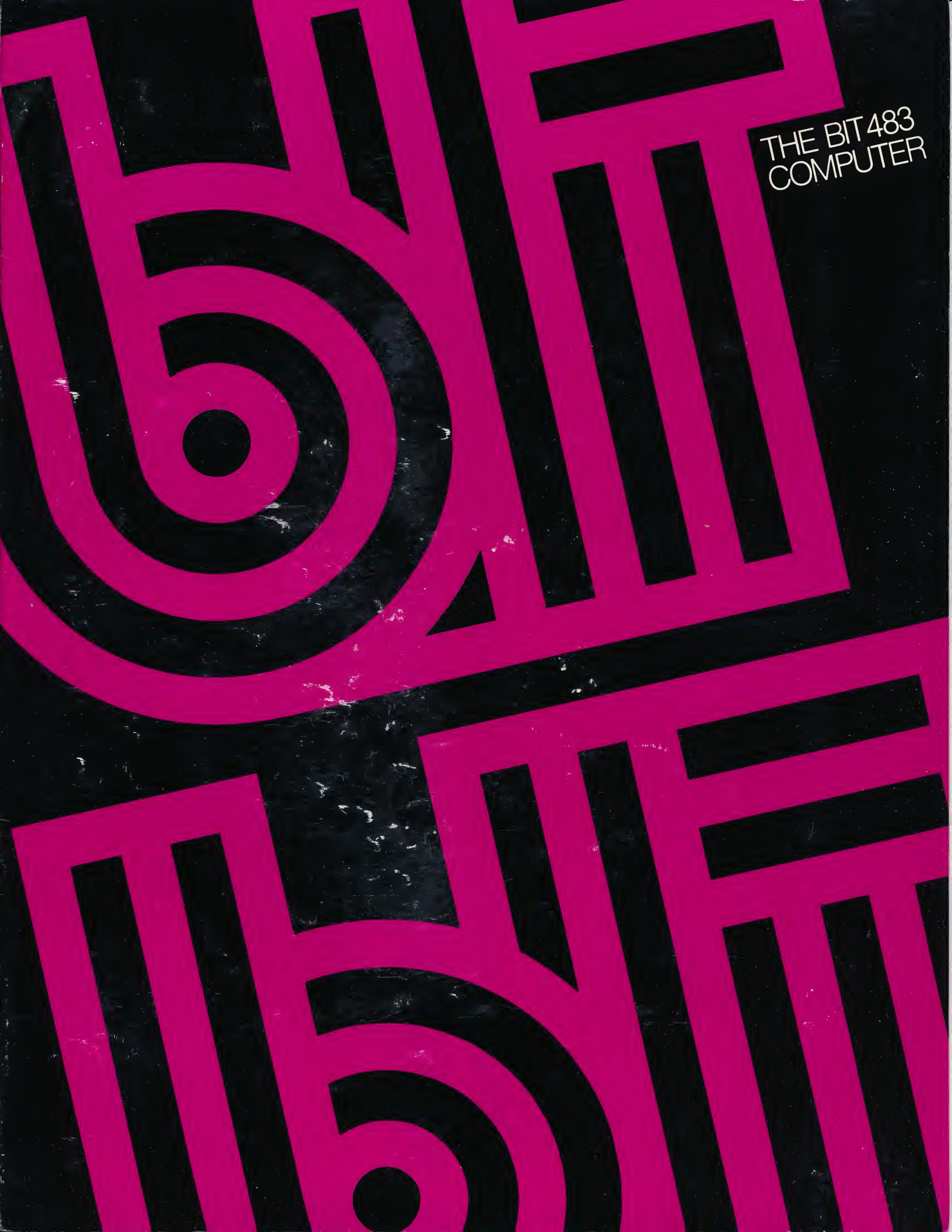


The background of the entire page is a high-contrast, abstract graphic. It features large, bold, pink geometric shapes on a black background. On the left side, there are two large, stylized, concentric circular or spiral-like shapes. On the right side, there are several vertical, parallel pink bars of varying heights, resembling a barcode or a stylized letter 'E'. The overall composition is dynamic and modern.

THE BIT 483
COMPUTER

A long time ago a semi-ape named Ok walked out of his cave with a long pole and used it as a lever to move a boulder out of his rutabaga patch.

Voila: A simple machine.

And then somebody figured a way to hook it up to a mastodon. Another guy added a few ornaments. Somebody refined it. And a couple of other people played around with it over the next few thousand years.

And voila: the computer. And it was sort of simple, too. All you needed was your average Phd. with a few years training and the manual dexterity of Van Cliburn to operate it.

So when we built our mini computer, the BIT 483, we figured one of the greatest advances in computer technology would be making it simple enough so that old Ok could walk out of his cave and operate it.

That's what we did, among other things.

We made a powerful general purpose digital mini computer. And it has proven performance and unbeatable problem solving capability. But it can be run by the village idiot.

The BIT 483 is the cost/performance leader of the minis, too.

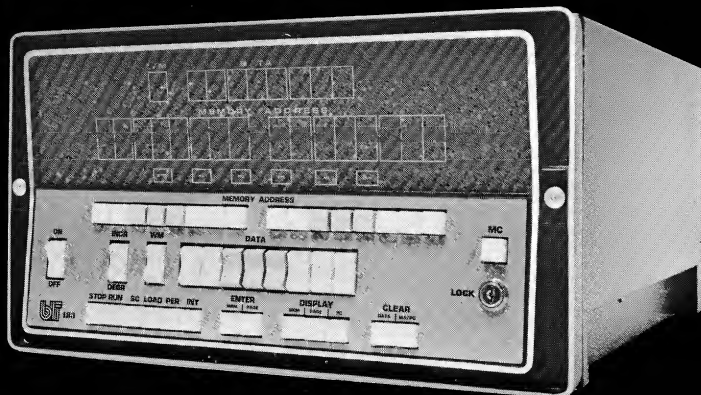
That's partly because we mass-produce the 483, which means we can deliver yesterday and discount the price.

And it's partly because of the features. Read about them on the following pages. And remember, the 483 is the latest in a family of miniputers that have been carrying a giant load in the field for years. It's sired by a company that's proven itself in the toughest proving ground in the world. The OEM market. We're a company that manufactures more than promises. We produce in volume and we service what we produce.

Check all the features Like BYTE orientation. Variable word length. Cycle stealing data channel. 980 nanosecond memory cycle time. Binary and decimal arithmetic. Priority interrupt. A complete line of I/O options.

Want more? Try power failure protection with automatic hardware storage of all arithmetic indicators; control panel lock; control panel interrupt; control panel increment/decrement; MSI/TTL construction throughout; Macroassembler; Intermediate Language assembler; USA FORTRAN; and up to 65,536 bytes of memory available: Teletype — buffered, interrupt mode and non-interrupt mode. And the 483 is beautifully programmer-oriented. The cost of programming and operating is minimized because all these controls are external: control panel interrupt, hardware bootstrap, main memory address incrementing/decrementing, and sense switches.

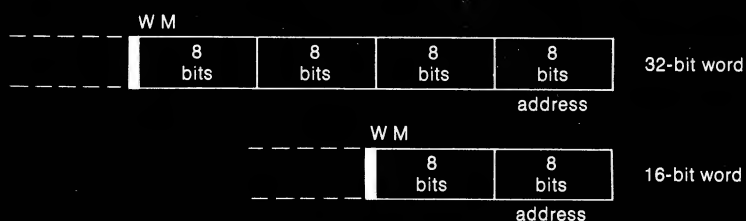
Variable word length lets you tailor the word size to the accuracy requirements of a problem. This eliminates the requirement for subroutines in multiple precision arithmetic. All 483 software is structured to allow the user to take maximum advantage of the mixed word length processing available.



Variable word length does much more than conserve memory space. For example, it is equally as easy to perform 8-bit, 16-bit, or even 2048-bit arithmetic with the 483. In all cases, only a *single* instruction is necessary.

Maximum memory efficiency and frequently simplified programming is permitted through the flexibility of having both the accumulator and words in core memory variable by program control.

A word in the 483 processor is any integral number of bytes:



The word is addressed at its low order byte and is word-marked at its high order end.

The examples below illustrate only a fraction of the power inherent in the 483 variable-word-length capability. In each example, only a *single* instruction is required.

There are four indicator flops set during every arithmetic and logical instruction: EQ (equal to zero), GR (greater than zero), MI (minus indicator), OVF (overflow). These indicators may be interrogated as a condition state for subsequent state jump instructions.

1. Unsigned Binary Subtract two 24 bit numbers (result in accumulator) Instruction BSA X

ACC	1 0 0 1 1 1 0 0	0 1 1 1 1 0 0 1	0 0 0 0 1 0 1 0				
X	0 1 1 1 1 1 1 0	1 0 0 0 0 1 0 0	0 1 0 1 0 0 1 1				
ACC RESULT	0 0 0 1 1 1 0 1	1 1 1 1 0 1 0 0	1 0 1 1 0 1 1 1	EQ	GR	MI	OVF
				0	1	0	0

2. Signed Binary Subtract two 16 bit numbers (result in accumulator) Instruction BSA Z

ACC	1 0 0 1 1 1 0 0	0 1 1 1 1 0 0 1					
Z	0 0 0 0 1 1 1 0	1 0 0 0 0 1 0 0					
ACC RESULT	1 0 0 0 1 1 0 1	1 1 1 1 0 1 0 1	EQ	GR	MI	OVF	
			0	1	1	0	

3. Signed Binary Add two 24 bit numbers (result in memory) Instruction BAM X

ACC	1 1 0 0 1 1 0 0	1 1 1 1 0 0 0 0	1 0 1 0 1 0 1 0				
X	1 1 1 1 0 0 0 0	1 1 0 0 1 1 0 0	0 1 0 1 0 1 0 1				
X RESULT	1 1 1 1 1 1 0 1	1 0 1 1 1 1 0 0	1 1 1 1 1 1 1 1	EQ	GR	MI	OVF
				0	1	1	0

4. Decimal Add two 6 digit Decimal Numbers (result in accumulator) Instruction DAA X

ACC	6	1	9	3	2				
X	2	3	1	7	8				
ACC RESULT	8	5	1	1	0	EQ	GR	MI	OVF
						0	1	*	*

5. Decimal Subtract two 4-digit Decimal Numbers (result in accumulator) Instruction DSA Y

ACC	4	3	2	1					
Y	9	8	7	6					
ACC RESULT	5	5	5	(-) 5	EQ	GR	MI	OVF	
					0	0	*	*	

6. Exclusive — Or two 16 bit numbers (result in memory) Instruction ORM X

X	1 1 0 0 1 1 0 0	1 1 1 1 0 0 0 0					
ACC	1 1 1 1 0 0 0 0	1 1 0 0 1 1 0 0					
X RESULT	0 0 1 1 1 1 0 0	0 0 1 1 1 1 0 0	EQ	GR	MI	OVF	
			0	1	*	*	

7. Logical And two 8 bit numbers (result in accumulator) Instruction ANA Y

ACC	1 1 0 0 1 1 0 0						
Y	1 1 1 1 0 0 0 0	EQ	GR	MI	OVF		
ACC RESULT	1 1 0 0 0 0 0 0	0	1	*	*		

*remains unchanged

Automatic loading from tape to core memory is standard with the BIT 483. This allows complete freedom from manually entering a bootstrap program before being able to load program tapes.

Obviously, operation becomes particularly simplified with such a feature. In addition the process of program loading is significantly accelerated. To use the loader one merely places the program tape on the reader and depresses the front panel LOAD key. The loading logic will read the entire tape into successive core memory positions, stopping automatically when a blank tape code is detected.

EASE OF INTERFACING

Interfacing of I/O devices onto a data channel of the BIT 483 is simplified through the use of BIT interface cards. A number of Integrated Circuit cards are offered, which allow the user to virtually ignore the complex problems of signal dialog between the device and the computer.

The cards contain all essential logic to enable the computer to address and select a device and to engage in a data transfer at a rate synchronous with the speed of the device. A single character, or a whole block can be transmitted as determined by the program.

The BIT 483's software package is comprehensive. Designed under the premise of providing the sophisticated user tools for creating complex systems it also allows the novice to program with little difficulty. The package includes a variety of assemblers, versatile and complete utility systems and mathematical aids, including a USA Standard Basic Fortran, for all applications.

ASSEMBLERS

ABIT-1 — A symbolic assembly language system, designed for 483 systems having a 1024 or 2048 byte memory capacity.

ABIT-4 — A symbolic assembly language system designed for 483 systems having a 4096 byte memory or larger.

MABIT — a modification of ABIT-4, including 17 interpretive floating-point function single-statement calls, including HTAN, ARCTAN, TRIG, LOG, e^x , and others.

MACROBIT — a macroassembler with a novel form for macro calls and a syntax using the full ASCII character set, which permits considerable economy of expression. MACROBIT can be thought of as a powerful string processor, followed by a very simple assembler.

IL — an advanced programming language, pioneered by BIT for minicomputer applications, permitting the user to program at a level of detail intermediate between assembly language and conventional higher level languages.



UTILITY SYSTEMS

EDIT — this text editor permits such source program modifications as corrections, additions, deletions, etc., in the assembly language tape.

SYTE — used in processors with minimal memories, SYTE permits source program modifications in assembly language, correction additions and deletions.

BOLD — an on-line debugging system used for new programs, permitting entry of break points, sub-program entries and exits, manual data listings, manual data entry and pseudo interrupts. Using 1.5K of core storage, BOLD also gives the operator direct control of all phases of processing.

BINREAD and Loader-T — these loader programs locate and load object programs and data into pre-selected memory areas.

BINPUNCH — used independently or as a segment of BOLD, this system permits the copying of selected memory data or programs onto punched paper tape. With BINPUNCH it becomes possible to copy a modified operating program on tape for re-use, eliminating need for reassembly for corrections and modifications.

MATH SOFTWARE

FORTRAN — a one-pass compiler, approximately equivalent to an "E" level subset of full FORTRAN IV, for producing an object program. Greatly simplifying the problem of program preparation, Fortran enables those with little knowledge of the computer's organization to write programs in a mixture of mathematical statements and English words.

MATH PACK — a set of subroutines which perform floating-point arithmetic, the capabilities of add, subtract, multiply, divide, sine, cosine, tangent, square root, exponential and log are provided among others.

CALC — essentially converts the 483 into a rapid desk calculator, capable of automatically performing 15 arithmetic functions, utilizing the ASR-33 teletype for input-output.

BEAT-4, BEAT-8 (BIT Easy Algebraic Translators) — Joss-Type conversational languages, option of program or calculator mode, requires minimum of 4K or 8K memory.

APPLICATIONS

Teams of BIT Applications Engineers and Programmers are available to customers to provide custom system-applications packages. Many packages such as these have been added to the wealth of application technology available to the BIT customer. Existing applications currently include:

SCIENTIFIC COMPUTER

As a free-standing computer, the BIT 483 with its FORTRAN Compiler and CALC desk calculator program makes a powerful and easy-to-use computer for the laboratory and as an experiment controller/monitor.

DATA TERMINAL

Connected to time-sharing systems as an "intelligent terminal", the BIT 483 Computer can edit, verify, preprocess and condense data prior to transmission and perform corresponding operations on received data, significantly reducing loads and costs on data lines and the time-sharing main frame computer.

PROCESS CONTROLLER

Interfaced to various analog and digital devices, the BIT 483 Computer monitors, records, calculates and generates control parameters for complex real-time processing systems in production processes, laboratory experiments, analytical systems, selection and routing systems.

DATA CONVERSION

Due to its low cost the BIT 483 Computer system is economical for data media conversion while providing the capability for searching, selection, editing, merging, verification and processing during conversion of data from one medium, such as paper tape, to another such as magnetic tape. Simply by adding appropriate peripheral units the one system can expand to handle printing, plotting, data transmission, etc.

CONTROL SUBSYSTEM

The BIT 483 Computer finds wide use in digital electronic systems. It can perform functions such as sync identification, framing, buffering, conversions of units, alarm value monitoring, channel selection, and scaling. As system controller the BIT 483 replaces the usual hard-wired control unit and adds the flexibility of programmable control.

EDUCATION

The BIT 483 Computer provides the ease of programming and comprehensive software required for teaching of and experiments in programming. Simplicity of logic and I/O structure permits practical student experiments in maintenance and interfacing. Addition of keyboard terminals expands the system to modest time-sharing operations over the campus.

NUMERICOM

Of particular note is the BIT 480/483 Numerical Control system application, time-proven in a weighty number of installations. NUMERICOM applications packages exist for many N/C machine tool controllers. Numerical Control has become an applications specialty at BIT, with this company virtually the leader in N/C tape preparation technology. BIT has introduced advancements to the state-of-the-art in N/C the most recent and significant of which is automatic contouring programs, whereby a complex contoured parts program can be produced requiring a minimum number of coordinates.



Numericom II is the latest numerical control tape preparation system applicable to the model 480/483. Basic requirements for its use are an 8K memory and teletypewriter.

The system handles many controllers from this one program. The parts programmer feeds data to the 483, 1st – specifications on the part, 2nd – specifying which equipment machines the part. The parts programmer has more control in this system.

The usual post processing needed to convert a computer tape to make it work on the appropriate machine, is not necessary with Numericom II.

The peripherals described below are not all that you can get with the BIT 483. Our engineers are constantly adding more, many of them custom-built for OEM systems requirements.

MASS MEMORY STORAGE

The model 390 Mass Memory utilizes the latest in laser-based electro-optic technology to provide nearly unlimited memory capabilities for the 483 system.

CRT DISPLAYS

Two cathode-ray displays are available, providing a choice between an economical, simplified readout system or one to meet the most demanding requirements.

PLOTTERS

Two plotters are offered in either flat-bed or drum configurations. Their capabilities cover a broad range of applications.

HIGH-SPEED PAPER TAPE READERS

Two readers are available in both reel-to-reel and fan-fold configurations. They provide a speed of operation many times faster than the standard ASR-33 teletype reader (300 cps in asynchronous mode). A companion 60-cps paper tape punch is also offered.

MEMORY DEVICES

Several memory devices are offered. Among them are a Drum Memory, Disc Memory (2.7 million bytes, at 720K bits/sec) and Tape Cassette.

OTHERS

Teletypes (both ASR-33 and ASR-35), IBM Selectric typewriter, High Speed Line Printer (356 lpm, 80 column), Magnetic tape transport (25 ips, 37½ ips; 7- and 9-channel).

SPECIFICATIONS

MEMORY

Cycle Time	980 nanoseconds
Capacity	variable from 1024 to 65,572 bytes
Power Failure Protection	power failure interrupt protects contents of memory

GENERAL

Circuit Technology	medium scale integration and ttl
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PROCESSOR

Word Size	variable in multiples of 8-bit bytes
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Page Size	256 bytes
Arithmetic	Signed Binary, Unsigned Binary and Decimal
Maximum Data Rates	Output: 8.16 million bits/second Input: 6 million bits/ second
Standard Data Channels	1 teletypewriter (C), 32 peripheral devices (G) if no A channel (16 if A channel is added)
Optional Data Channel	16 peripheral devices (A)
Sense Switches	9 provided on front panel
Channel Modes (under program control)	overlapped (cycle- stealing), non-over- lapped
Teletype Modes (under program control)	buffered, non-interrupt mode buffered, interrupt mode
Priority Interrupts	eight basic (can be increased in groups of 8 to 32)

ELECTRICAL

Primary Power	115/230VAC $\pm 10\%$, 50/60 Hz
Power Consumption	500 watts

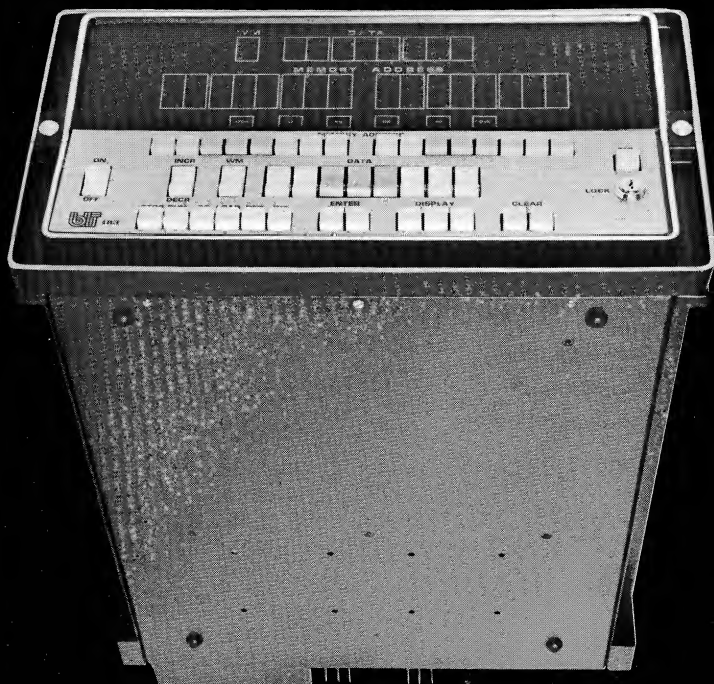
PHYSICAL

Weight	50 pounds
Dimensions	10½" H x 19½" W x 23" D
Mounting Options	standard 19" rack, pedestal or table-top

ENVIRONMENTAL

Temperature	0 to 50° C
Relative Humidity	95% maximum

Instruction	Execute Timing (cycles)	Mnemonic	Functional Description
Jump Instructions			
Jump return from interrupt	3.0	*JRI	Jump return from interrupt
Unconditional jump	3.0	*JMP	Unconditional jump
Jump if EQ	3.0	*JEQ	Jump if equal flop is set
Jump if $\overline{\text{EQ}}$	3.0	*NEQ	Jump if equal flop is not set
Jump if GR	3.0	*JGR	Jump if greater flop is set
Jump if $\overline{\text{GR}}$	3.0	*NGR	Jump if greater flop is not set
Jump if GR & EQ	3.0	*JGE	Jump if greater and equal flops are both set
Jump if $\overline{\text{GR}} \& \overline{\text{EQ}}$	3.0	*NGE	Jump if greater and equal flops are not both set
Jump on peripheral test	3.0	*JPT	Jump if positive response from peripheral equipment
Jump to subroutine	5.6	*JSR	Jump to subroutine
Jump if MI	3.0	*JMI	Jump if minus flop is set



Instruction	Execute Timing (cycles)	Mnemonic	Functional Description
Jump if $\overline{MI}$	3.0	*NMI	Jump if minus flop is not set
Jump if OV	3.0	*JOV	Jump if overflow flop is set
Jump if $\overline{OV}$	3.0	*NOV	Jump if overflow flop is not set
Jump if EQ or GR	3.0	*EOG	Jump if equal or greater flop is set
Jump if $\overline{EQ}$ or GR	3.0	*ENG	Jump if greater flop is not set and if equal flop is not set

Peripheral Control Instruction			
Peripheral Select		PCI	Selects one of 16 devices on a selected channel
Logical Instructions			
Exclusive or to accumulator	2.3n	ORA	Exclusive or the contents of memory to the contents of the accumulator
Exclusive or to memory	2.3n	ORM	Exclusive or the contents of the accumulator to the contents of memory
Logical and to accumulator	2.3n	ANA	And the contents of the memory to the contents of the accumulator
Logical and to memory	2.3n	ANM	And the contents of the accumulator to the contents of memory
Binary Instructions			
Binary add to accumulator	2.3n	BAA	Binary add the contents of memory to the contents of the accumulator
Binary add to memory	2.3n	BAM	Binary add the contents of the accumulator to the contents of memory
Binary subtract from accumulator	2.3n	BSA	Binary subtract the contents of memory from the contents of the accumulator
Binary subtract from memory	2.3n	BSM	Binary subtract the contents of the accumulator from the contents of memory
Decimal Instructions			
Decimal add to accumulator	2.3n	DAA	Decimal add the contents of memory to the contents of the accumulator



THE BIT483 COMPUTER

BIT, Inc.
5 Strathmore Road
Natick, MA 01760
(617) 237-2930

WHY THE BIT 483 ?

The BIT 483 is a compact powerful digital computer that combines proven design performance with unparalleled problem solving capabilities. Its 350 nanosecond memory access time (MSI and TTL Logic) makes it one of the fastest computers available on the market today. This speed, coupled with a cycle stealing capability, as a standard feature, provides the user with a hardware environment suitable for all data processing or control needs.

VARIABLE WORD LENGTH saves memory by eliminating the need for multiple precision arithmetic subroutines. Programming is simplified by the ability to tailor word size to fit problem needs. Only one instruction is needed to handle a word, whether its length be 8, 16, 24, 32 or 2048 bits.

BYTE ORIENTATION makes it ideal for data communication. Input/output is 8 bits in parallel.

DECIMAL ARITHMETIC eliminates the need to convert to binary for computation, then convert back to decimal for output. The 483 also has the usual binary arithmetic ability.

EASE OF INTERFACING. BIT integrated circuit cards are available, practically eliminating complex signal problems between computer and devices. These cards contain the essential logic to address and select a device. Data transfer is at a rate synchronous with the speed of devices involved.

AUTOMATIC LOADING from tape to core memory is standard on the 483. *NO* manual bootstrap program must be loaded prior to loading a program.

PRIORITY INTERRUPTS are available in block of 8, with maximum of 32.

SOFTWARE. The 483 is beautifully programmer oriented. There is control panel interrupt, panel incrementing/decrementing of memory, panel sense switches. Programs available are: FORTRAN, MATH PACK, CALC, MEMORY SAVING ABIT-4, plus other assemblers and utilities.

The 483 can be a **SATELLITE TO A MAJOR SYSTEM** OR A **FREE STANDING COMPUTER** with a wide range of peripherals.

APPLICATIONS

Some of the existing equipment applications are:

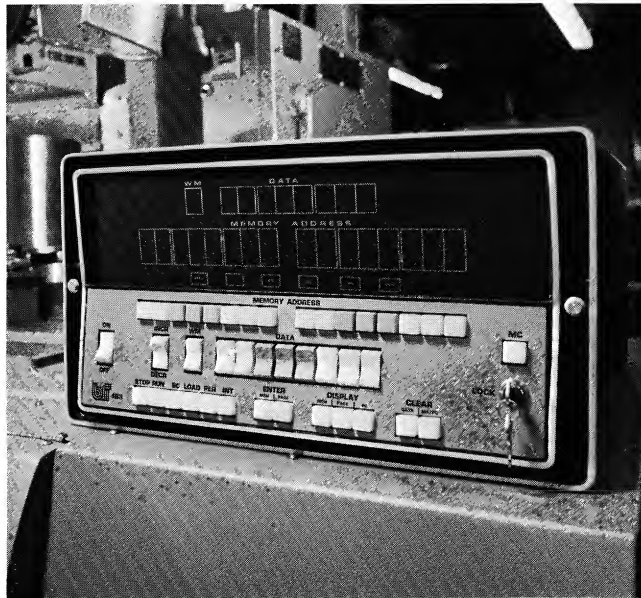
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BIT, Inc.

5 Strathmore Road, Natick
MA 01760 (617) 237-2930

All BIT 483 Software listed below is included with each computer delivery!

The package is comprehensive, providing the sophisticated user tools for complex systems, allowing a novice to program with ease.

ASSEMBLERS

ABIT-4

A symbolic assembly language system.

MABIT

A modification of ABIT-4, including 17 interpretive floating-point function single-statement calls, including HTAN, ARCTAN, TRIG, LOG, e^x.

MACROBIT

A macroassembler with a novel form for macro calls and a syntax using the full ASCII character set, which permits considerable economy of expression.

IL

An advanced programming language, pioneered by BIT, permitting the user to program at a higher level of detail than assembly language.

UTILITY SYSTEMS

EDIT

Text editor permits source program modifications such as corrections, additions, deletions, etc., in the assembly language tape.

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An on-line debugging system used for new programs, permitting entry of break points, subprogram entries and exits, manual data listings, manual data entry and pseudo interrupts.

BINREAD and Loader-T

These loader programs locate and load object programs and data into preselected memory areas.

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Used independently or as a segment of BOLD, this system permits the copying of selected memory data or programs onto punched paper tape.

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FORTRAN

A one-pass compiler, approximately equivalent to a "E" level subset of full FORTRAN IV, for producing an object program.

MATH PACK

A set of subroutines which perform floating-point arithmetic, the capabilities of add, subtract, multiply, divide, sine, cosine, tangent, square root, exponential and log are provided.

CALC

Essentially converts the 483 into a rapid desk calculator, capable of automatically performing 15 arithmetic functions.

BEAT-4 (BIT Easy Algebraic Translator)

A JOSS-TYPE conversational language, option of program or calculator mode, requires minimum of 4K memory.

BIT 483 SPECIFICATIONS (MSI & TTL)

MEMORY

Access time 350 nanoseconds
Cycle time 980 nanoseconds
1,024 to 65,536 bytes
8 bit parallel access
Contents protected by power failure interrupt

CENTRAL PROCESSOR

Word size – variable
– multiples of 8 bits (byte)
Page size – 256 bytes
Arithmetic – signed decimal
– signed & unsigned binary
Input maximum data rate 6,000,000 bits/second
Output maximum data rate 8,000,000 bits/second

INPUT/OUTPUT

1.02 megabytes/second
Direct memory access
Multiplexer channel (G) 32 Peripherals
Control channel (C) ASR33-35
Buffered/overlapped (cycle stealing) channels
Optional channel (A) 16 devices

TELETYPE

Buffered, non-interrupt mode
Buffered, interrupt mode

PRIORITY INTERRUPTS

8 basic, up to 32

115/230 VAC $\pm 10\%$, 50/60 HZ, 500 Watt consumption, 50 pounds, 10½" H, 19½" W, 23" D, Environment 0-50° C, 95% maximum relative humidity.

BIT HOME OFFICES

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